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			04/15/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/534,177

Applicant(s)

KUWAHARA ET AL.

Examiner

John P. Zimmermann

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-6 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-6 & 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The Drawings were originally objected to and while the Applicant's response indicates the figures were amended and Replacement Sheets were enclosed, no such Replacement Sheets were received by the office and therefore the original objection still stands.
2. Applicant is requested to provide the replacement drawings as indicated with any future correspondence.

Specification

3. The examiner has approved the changes to the specification submitted on 12 February 2008 to include the amended abstract and subsequently, the objection is withdrawn.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
7. **Claims 2-4 & 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kobayashi et al.**, (US 6,527,375 B2) from this point on referred to as “**Kobayashi et al. B2**” in view of **Kobayashi et al.**, (JP 11-207963 A) from this point on referred to as “**Kobayashi et al. A**” and **Lee et al.**, (US 6,536,873 B1).
 - a. As related to independent **claim 2**, Kobayashi et al. B2 teach a printing apparatus comprising a head including a plurality of ink discharging portions (Kobayashi et al. B2 – Figure 1, Reference #103 & #107, shown below) provided in a juxtaposed linear relationship thereon (Kobayashi et al. B2 – Figure 3a & 3b, shown below) configured to deflect an ink droplet (Kobayashi et al. B2 – Figure 5, Reference #A3, shown below) to be discharged therefrom in a plurality of directions (Kobayashi et al. B2 – Figure 3, notably “x” direction & Figure 6, Reference #C, shown below).

FIG. 1

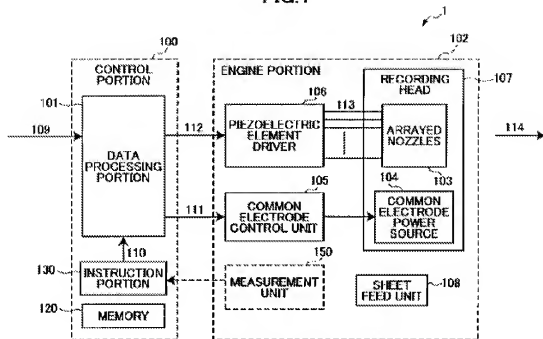


FIG.3(a)

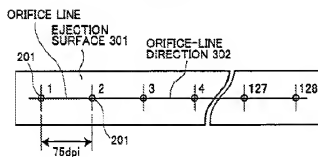


FIG.3(b)

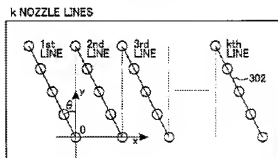


FIG. 5

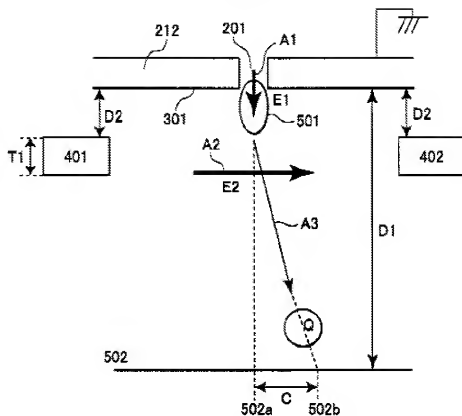
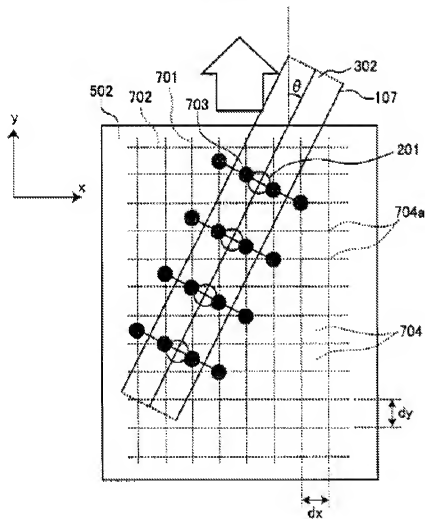


FIG. 6

ELECTRIC VOLTAGE Vchg (V)	DEFLECTION AMOUNT c (μ m)	AVERAGE SPEED Vav (m/sec)
200	187	2.45
100	94	2.49
0	0	2.46
-100	-94	2.38
-200	-187	2.42

- b. Continuing with **claim 2**, Kobayashi et al. B2 teach the printing apparatus capable of setting the discharging deflection angle which is a maximum deflection amount of the ink droplet to be discharged from said ink discharging portions to a plurality of angles (Kobayashi et al. B2 – Figure 7, Reference #201 & #703, shown below).

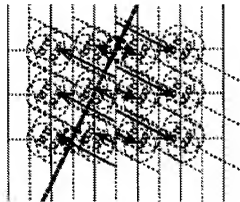
FIG. 7



- c. Continuing with **claim 2**, Kobayashi et al. B2 teach the head is configured to determine a printing resolution in response to print data from between or among a

plurality of printing resolutions which are determined based on a distance separating said ink discharging portions, the discharging deflection angle of the ink droplet to be discharged from said ink discharging portions and a plurality of directions in which the ink droplet can be discharged from said ink discharging portions (Kobayashi et al. B2 – Preferred Embodiment, Column 4, Lines 20-24 & 34-43 and Figure 1, Reference #101, #110, #111, #112, #120, & #130, shown previously). Additionally, Kobayashi et al. B2 teach the head is configured to select ink discharging portions from which an ink droplet can be discharged and the discharging deflection angle of the discharged ink droplet based on the determined printing resolution and to determine the discharging direction of one or two or more ink droplets from the selected ink discharging portions and the head is configured to determine the discharging direction of the ink droplet for each of the selected ink discharging portions to execute printing with the determined printing resolution (Kobayashi et al. B2 – Preferred Embodiment, Column 10, Lines 50-57 and Figure 13(b), shown below).

FIG.13(b)



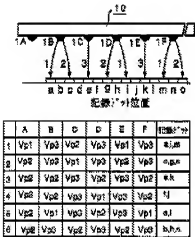
- d. Continuing with **claim 2**, while Kobayashi et al. B2 teach making the discharging deflection angle variable in order to further increase the width of the resolution

(Kobayashi et al. B2 – Figure 7, shown previously and Figure 11, shown below), the specific resolutions *are not* detailed. *However*, Kobayashi et al. A teach controlling the ink discharging direction to print with a plurality of resolutions and details the plurality of resolutions specifically (Kobayashi et al. A – Abstract and Figures 6 & 7, shown below).

【図7】

【図7】

【図6】



記録した位置	1ドット間の距離 (μm)	解像度 (dpi)	記録速度 (mm/sec)
	28	900	9.3
	40	636	9.3
	56	450	9.3
	80	318	9.3
	85	300	16.7
	120	212	16.7

c. Continuing further with **claim 2**, while Kobayashi et al. B2 teach making the discharging deflection angle variable (Kobayashi et al. B2 – Preferred Embodiment, Column 4, Lines 20-24 & 34-43 and Figure 1, Reference #101, #110, #111, #112, #120, & #130, shown previously) and Kobayashi et al. A teach the plurality of resolutions and

even tend to show deflection angles that vary in a plurality of directions coplanar with the line connecting the ink discharging portions (Kobayashi et al. A – Abstract and Figure 6 Reference #1B, #1, & #2, shown above), the combination of the two does not appear to directly show every detail specified in the presently amended **claim**. *However*, Lee et al. teach a printing apparatus which includes a printhead [i.e. print head body] made up of a plurality of ink discharging portions [i.e. orifice] which are configured to deflect ink droplets in a plurality of directions coplanar with the line connecting the ink discharging portions (Lee et al. – Title; Abstract; Detailed Description, Column 7, Line 31 – Column 8, Line 13; and Figure 7, Reference #170, #215, #260a, #260b, $-a$, $+a$ shown below).

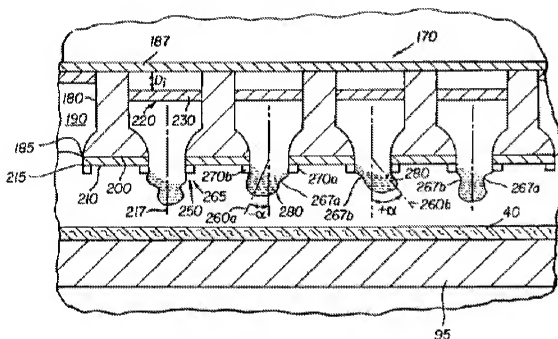


FIG. 7

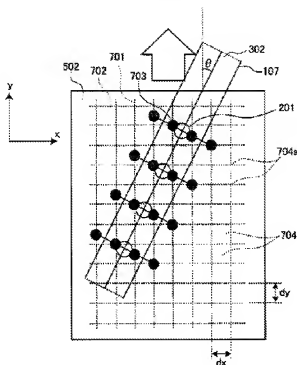
f. As related to independent **claim 8**, Kobayashi et al. B2 teach a printing method in which a head including a plurality of ink discharging portions (Kobayashi et al. B2 –

Abstract and Figure 1, Reference #103 & #107, shown previously) provided in a juxtaposed linear relationship thereon is used (Kobayashi et al. B2 – Figure 3a & 3b, shown previously). Kobayashi et al. B2 also teach deflecting a discharging direction of an ink droplet to be discharged from each of said ink discharging portions to a plurality of directions (Kobayashi et al. B2 – Figure 5, Reference #A3, shown previously) in the juxtaposition direction of said ink discharging portions and additionally the discharging deflection angle which is a maximum deflection amount of the ink droplet to be discharged from said ink discharging portions can be set to a plurality of angles (Kobayashi et al. B2 – Figure 7, Reference #201 & #703, shown below).

FIG. 6

ELECTRIC VOLTAGE V_{chg} (V)	DEFLECTION AMOUNT c (μm)	AVERAGE SPEED V_{av} (m/sec)
200	187	2.45
100	94	2.49
0	0	2.46
-100	-94	2.38
-200	-187	2.42

FIG. 7



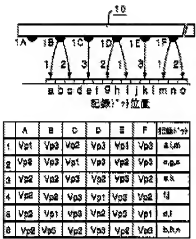
g. Continuing with **claim 8**, Kobayashi et al. B2 teach determining a printing resolution in response to print data from between or among a plurality of printing resolutions which are determined based on a distance separating said ink discharging portions, the discharging deflection angle of the ink droplet to be discharged from said ink discharging portions and a plurality of directions in which an ink droplet can be discharged from said ink discharging portions (Kobayashi et al. B2 – Preferred Embodiment, Column 4, Lines 20-24 & 34-43 and Figure 1, Reference #101, #110, #111, #112, #120, & #130, shown previously). Additionally, Kobayashi et al. B2 teach selecting the ink discharging portions from which the ink droplet can be discharged and the discharging deflection angle of the ink droplet based on the determined printing resolution and determining the discharging direction of one or two or more ink droplets

from the selected ink discharging portions on one line is determined and determining the discharging direction of an ink droplet for each of the selected ink discharging portions to execute printing with the printing resolution determined in response to the print data from between or among the plurality of printing resolutions (Kobayashi et al. B2 – Preferred Embodiment, Column 10, Lines 50-57 and Figure 13(b), shown previously). While Kobayashi et al. B2 teach making the discharging deflection angle variable in order to further increase the width of the resolution (Kobayashi et al. B2 – Figure 7, shown previously and Figure 11, shown below), the specific resolutions *are not* detailed. *However*, Kobayashi et al. A teach controlling the ink discharging direction to print with a plurality of resolutions and details the plurality of resolutions specifically (Kobayashi et al. A – Abstract and Figures 6 & 7, shown below).

【図7】

図7

【図6】



記録ヘッド形状	1" x 1" 中心 間隔 (μm)	解像度 (dpi)	記録速度 (mm/sec)
	28	900	9.3
	40	636	9.3
	56	450	9.3
	80	318	9.3
	85	300	18.7
	120	212	18.7

h. Continuing with **claim 8**, while Kobayashi et al. B2 teach deflecting a discharging direction so that an ink droplet can be discharged to a plurality of directions (Kobayashi et al. B2 – Figure 5, Reference #A3, shown previously) and Kobayashi et al. A teach the plurality of resolutions and even tend to show deflecting a discharging direction in a plurality of directions coplanar with the line connecting the ink discharging portions (Kobayashi et al. A – Abstract and Figure 6, Reference #1B, #1, & #2, shown above), the combination of the two does not appear to directly show every detail specified in the presently amended **claim**. *However*, Lee et al. teach a printing method which includes a printhead [i.e. print head body] made up of a plurality of ink discharging portions [i.e.

orifice] which deflect ink droplets in a plurality of directions coplanar with the line connecting the ink discharging portions (Lee et al. – Title; Abstract; Detailed Description, Column 7, Line 31 – Column 8, Line 13; and Figure 7, Reference #170, #215, #260a, #260b, #-a, #+a shown below).

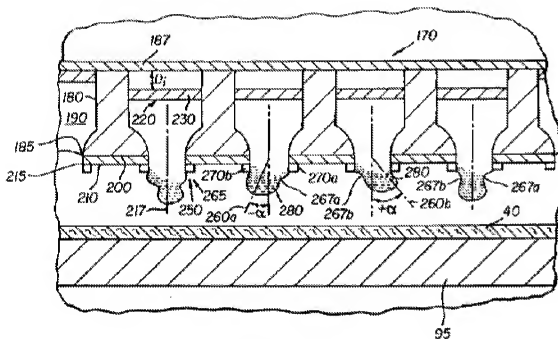


FIG. 7

Given the same field of endeavor, specifically an inkjet image forming apparatus with deflection control of ink droplets and applicable printing method, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording device comprising a head including a plurality of ink discharging portions with controls for adjusting the resolution of the printed image by controlling the landing position of the ink droplets and applicable printing method (Kobayashi et al. – Abstract) as taught by Kobayashi et al. B2 with the ink-jet recording apparatus having the ability to print a plurality of specific resolutions by adjusting the

deflection of the ink droplets as taught by Kobayashi et al. A as well as the specific configuration capable of or step of deflecting a discharging direction of an ink droplet to be discharged from each of the ink discharging portions to a plurality of directions coplanar with the line connecting the ink discharging portions as taught by Lee et al. in an effort to enhance the image formation and allow recording of fine high-resolution images (Kobayashi et al. A – Abstract) while providing an advantage over that which was well known in the art at the time the invention was made by enabling each ink ejecting portion to print ink marks at locations normally printed by another ink ejecting portion (Lee et al. - Detailed Description, Column 9, Lines 41-54). The similarities of the field of endeavor and motivation to combine are further exemplified by the International Preliminary Examination Report, which details the obviousness of the present invention with regards to Kobayashi et al. A (PCT/IEA/409 – Block V., Sub-Block 2.)

i. As related to dependent **claim 3**, the previous combination of Kobayashi et al. B2, Kobayashi et al. A, and Lee et al. remains as applied to **claim 2**, additionally Kobayashi et al. B2 teach printing resolutions of said printing apparatus corresponding to print data are determined in advance [i.e. stored in the memory], and a printing resolution is determined in response to the print data [i.e. selected program] based on the determination (Kobayashi et al. B2 – Preferred Embodiment, Column 4, Lines 35-41 and Figure 1, Reference #110, #120, & #130, shown previously).

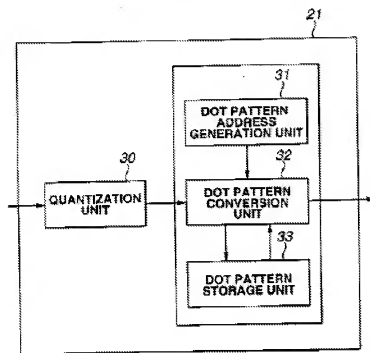
j. As related to dependent **claim 4**, the previous combination of Kobayashi et al. B2, Kobayashi et al. A, and Lee et al. remains as applied to **claim 2**, additionally Kobayashi et al. B2 teach the resolution of the print data is M [i.e. selected program], if said printing apparatus has $M \times n$ (n being a natural number) or $M \times 1/n$ as a printing resolution with which said printing apparatus can print, then the printing resolution is determined to $M \times$

n or M x 1/n (Kobayashi et al. B2 – Preferred Embodiment, Column 4, Lines 35-41; Column 6, Lines 1-10; Column 12, Lines 62-67 and Figure 1, Reference #110, #120, & #130, shown previously).

8. **Claims 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kobayashi et al.**, (US 6,527,375 B2) from this point on referred to as “**Kobayashi et al. B2**,” **Kobayashi et al.**, (JP 11-207963 A) from this point on referred to as “**Kobayashi et al. A**,” and **Lee et al.**, (US 6,536,873 B1) as applied to **claim 2** above, and further in view of **Ogasahara et al.**, (US 2003/0030824 A1).

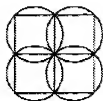
a. As related to dependent **claim 5**, the previous combination of Kobayashi et al. B2, Kobayashi et al. A, and Lee et al. remains as applied above, but *does not* specifically teach inputted print data includes information of a resolution or a number of pixels together with information of a print size. *However*, Ogasahara et al. teach an image printing apparatus (Ogasahara et al. – Title) where the print data includes information of a resolution or a number of pixels (Ogasahara et al. – Abstract) together with information of a print size, the printing resolution is determined based on the information of the print size and the resolution or the information of the print size and the number of pixels (Ogasahara et al. – Summary, Paragraphs 18 & 158 and Figure 17, shown below).

FIG.17



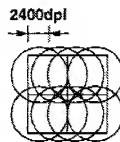
b. As related to dependent **claim 6**, the previous combination of Kobayashi et al. B2, Kobayashi et al. A, and Lee et al. remains as applied above, but *does not* specifically teach two different printing resolutions. *However*, Ogasahara et al. teach part of the print data is determined to a first printing resolution and the other part of the print data is determined to a second printing resolution different from the first printing resolution [i.e. different color tones without decrease in image quality] (Ogasahara et al. – Summary, Paragraphs 17, 167, & 177 and Figures 21A & 21B, shown below).

FIG.21A



Cyan/Magenta/Yellow/Black

FIG.21B



Light Cyan/Light Magenta

Given the same field of endeavor, specifically an inkjet image forming apparatus with multiple output resolutions, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording device comprising a head including a plurality of ink discharging portions with controls for adjusting the resolution of the printed image with the ability to print a plurality of specific resolutions by adjusting the deflection of the ink droplets in a plurality of directions coplanar with the line connecting the ink discharging portions as taught by the combination of Kobayashi et al. B2, Kobayashi et al. A, and Lee et al. with the ink-jet recording apparatus with the ability to print a plurality of dot arrangement patterns specifically those of different resolutions as taught by Ogasahara et al. in an effort produce a high-quality image having excellent gradation while reducing the cost of the apparatus and increasing data processing speed (Ogasahara et al. – Abstract and Background, Paragraph 16).

Response to Arguments

9. Applicant's arguments with respect to **claims 2-6 & 8** have been considered but are moot in view of the new ground(s) of rejection.
10. With respect to **claim 2**, and therefore **claims 3-6**, which inherently contain all of the limitations of independent **claim 1**, applicant amended the independent claim to completely alter and further specify the limitations of the ink discharging portion of the printing apparatus to deflect the ink droplets in a plurality of directions "coplanar with the line connecting the ink discharging portions." Due to these amendments, a further search was necessitated thereby pointing out the similarities taught in previously cited prior art and demanding a new grounds of rejection. Applicant argues "*Kobayashi B2* fails to teach or suggest that the ejected ink droplets are deflected in a plurality of directions coplanar with the line connecting the ink discharging portions as required by Claim 1 {typo in response, should be Claim 2}." In response to applicant's argument that "*Kobayashi B2* fails to teach or suggest... as required by Claim 1 {typo in response, should be Claim 2}," Examiner has provided a new ground(s) of rejection that specifically addresses the newly incorporated limitations of amended **claim 2**, and applicant is requested to see the rejection detailed above for further response to applicant's argument of patentability. As applicant merely argued that **claims 3-6** depend from **claim 2** with no further argument as to patentability, the rejection as detailed above stands.
11. With respect to **claim 8**, applicant merely argued that "Independent Claim 8 recites the same distinguishable limitation as that of Claim 1." Examiner has provided a new ground(s) of rejection that specifically addresses the newly incorporated limitations of amended **claim 8**, and

applicant is requested to see the rejection detailed above for further response to applicant's argument of patentability.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Zimmermann whose telephone number is (571)270-3049. The examiner can normally be reached on Monday - Thursday, 7:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on 571-272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2861

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JPZ

/LUU MATTHEW/

Supervisory Patent Examiner, Art Unit 2861